

| <u>Claim Element</u> | <u>Description of Claim Element</u> |
|----------------------|--|
| 1 | "each set comprises $M + 1$ playing cards" |
| 2 | "each playing face of each playing card of the first set displays an integer within the range of 0 to M which is different from all the other integers displayed on all the other playing faces of the playing cards of the first set" |
| 3 | "each playing face of each playing card of the second set displays an integer within the range of 0 to M which is different from all the other integers displayed on all the other playing faces of the playing cards of the second set" |

Hence, when M equals 12, elements 1-3 of claim 17 respectively require (1) that each set comprise 13 playing cards (i.e., when $M = 12$, $M + 1 = 13$) and, as shown in the following Table A, (2) that each of the 13 playing faces of the 13 playing cards of the first set display a different integer within the range of 0 to 12, and (3) that each of the 13 playing faces of the 13 playing cards of the second set display a different integer within the range of 0 to 12:

Table A

Claim 17 – Integers Required to be Displayed and Number of Playing Cards
Required Per Set When M Equals 13

| <u>Required Playing Cards</u> | <u>Required Displayed Integers</u> | |
|-------------------------------|------------------------------------|---------------------------|
| | <u>1st Set</u> | <u>2nd Set</u> |
| 1 | 0 | 0 |
| 2 | 1 | 1 |
| 3 | 2 | 2 |
| 4 | 3 | 3 |
| 5 | 4 | 4 |
| 6 | 5 | 5 |
| 7 | 6 | 6 |
| 8 | 7 | 7 |
| 9 | 8 | 8 |
| 10 | 9 | 9 |
| 11 | 10 | 10 |
| 12 | 11 | 11 |
| 13 | 12 | 12 |

In contrast, while Morales teaches a deck composed of 4 sets with each set contain 13 playing cards, as can be seen from Morales' FIG.1 and the following excerpts from his specification, Morales fails to teach or suggest either the requirement of element 2 of claim 17 that each playing face of each playing card of a first set display a different integer within the range of 0 to 12 or the requirement of element 3 of claim 17 that each playing face of each playing card of a second set display a different integer within the range of 0 to 12:

The deck consists of 52 cards, **each containing integers between -6 and +6.** (Morales, Abstract, lines 2-5; emphasis added.)

• • •

The game apparatus of the present invention is a deck of 52 cards, consisting of four sets of cards, **each marked with the integers -6 through +6, inclusive.** (Morales, column 1, lines 39-41; emphasis added.)

• • •

Thus, the deck is similar in configuration to a conventional deck having **thirteen numerical values (+6 to -6)**, four suits (+, -, x, ÷), and two colors (red and black). (Morales, column 2, lines 33-36; emphasis added.)

Accordingly, Morales only teaches that while each of his sets consist of 13 playing cards, the playing faces only display integers within the range of -6 to +6. Therefore, Morales does not teach or suggest even one set comprising 13 playing cards whose 13 playing faces each display a different integer within the range of 0 to 13 as required by claim 17.

In addition, as can be seen from the following excerpts, Morales teaches away from eliminating the presence of negative numbers from the playing faces of his playing cards because such modification would render the modified deck inoperative for many of Morales' deck's intended uses:

Unlike the prior art, the present invention also highlights such basic concepts as... **negative value** ... (Morales, Abstract, lines 10-13; emphasis added.)

• • •

It is an object of this invention to provide an educational game apparatus that instructs children about basic mathematical

concepts like ... **negativity**. (Morales, column 1, lines 64-66; emphasis added.)

• • •

This simple game is intended to teach young children the distinction between positive and **negative** integers. (Morales, column 2, lines 51-53; emphasis added.)

• • •

This again reinforces the concepts of positive and **negative**, and numerical value. (Morales, column 2, lines 60-61; emphasis added.)

• • •

This game would emphasize concepts of ... positive and **negative** value. (Morales, column 3, lines 21-23; emphasis added.)

Accordingly, eliminating the presence of negative numbers from the playing faces of Morales' playing cards would render the modified deck inoperative for their intended purpose for use in highlighting, instructing, reinforcing, and emphasizing the concept of negative value. Thus, one skilled in the art would not modify the playing cards of Morales to make them unsuitable for their intended purpose. *Ex parte Rosenfeld*, 130 USPQ 113, 115 (POBA 1961). Therefore, Morales, in effect, teaches away from eliminating the presence of negative numbers from the playing faces of his playing cards. *In re Gordon*, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

Furthermore, nothing in Heckman counteracts the fact that Morales teaches away from eliminating the presence of negative numbers from the playing faces of his playing cards.

In support of its 103(a) rejection of claim 17-19, the Office Action relies on Heckman for "[teaching] cards with integer values that could be 10 and higher." (Office Action, page 5, last paragraph, and page 6, second paragraph.) However, for the following reasons, Heckman fails to provide any suggest or motivation for including higher integers on Morales' playing cards. First, in the following excerpt, Heckman teaches that his cards are used solely for the purpose of randomly generating a number that must be duplicated by other components of his mathematical instruction means:

As illustrated in FIGURE 6, a plurality of cards may be provided, each having a number on one face and being blank on the other. The cards may be arranged in a stack with the numbered faces hidden so that the student may turn over a card to expose a particular number. Such cards may be arranged at random so that the student will have no indication as to the number on the underside of the card he is about to expose.

The cubes and the cards may be used in the following manner. As above indicated, one of the cards 20 is turned over to expose a number, such as the number 18 as illustrated in FIGURE 6. The student then arranges the two sets of numbered cubes 10 and 12 with the cubes 18 having arithmetical signs to show an equivalent form of the number exposed on the card. (Heckman, column 2, lines 37-51.)

As indicated in the above quoted text, Heckman only teaches that during game play one of her numbered cards is turned over to expose the number displayed on that card's face. A player then manipulates non-card elements (e.g., number cubes and mathematic operation cubes) to generate an equivalent form of the randomly generated number displayed on the face of turned over card. Thus, Heckman does not teach or suggest that the numbers appearing on the faces of her cards be added, subtracted, multiplied, divided, or subjected to any other interactive mathematical operation. Therefore, Heckman fails to provide any suggest or motivation for including higher integers on the playing

faces in a deck of playing cards (such on the playing faces of Morales' deck of playing cards) where two or more of such cards are used interactively by subjecting the integers on their playing faces to interactive mathematical operations such as addition, subtraction, multiplication, division operations, etc.

Since claims 18-19 depend from claim 17, claims 18-19 contain all the above discussed claim limitations or elements of claim 17 and are, therefore patentable over Morales and Heckman for the reasons discussed above with respect to claim 17. Hence, withdrawal of the 103(a) rejection of claims 17-19 over Morales in view of Heckman is respectfully requested.

VI. Amended Claims 1-3 Are Patentable Over the References

For the following reasons, amended claims 1-3 are patentable over Morales in view of Heckman. First, amended claim 1 requires, inter alia, that the claimed deck comprise "sets of playing cards, where ... the sets of playing cards **consist of** a first set of playing cards and a second set of playing cards." (Emphasis added.) The "consist of" claim limitation mandates that **two, and only two**, sets of playing cards be present in the deck of amended claim 1. In contrast, as can be seen from the following excerpts, Morales teaches that his deck consists of **four** sets or suits:

The deck consists of 52 cards, each containing integers between -6 and +6. There are **four "suits,"** (Morales, Abstract, lines 2-5; emphasis added.)

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The game apparatus of the present invention is a deck ... consisting of **four sets** of cards ... (Morales, column 1, lines 39-41; emphasis added.)

• • •

Referring now to the drawings in greater detail, the invention 1 shown in FIG. 1 consists of a plurality of playing cards ... **with each integer indicated on four of the cards. It can be further seen that the four basic mathematical operations are indicated on the cards (+, -, x, and ÷), also equally apportioned so that each card contains a different combination of arithmetic operation and integer notations.** ... Thus, the deck is similar in configuration to a conventional deck having ... **four suits (+, -, x, and ÷) ...** (Morales, column 2, lines 22-36; emphasis added.)

In view of the above excerpts, Morales teaches that his decks contain four suits.

Furthermore, as can be seen from the following excerpt, a deck containing four suits or sets is required in order to play at least one of Morales' card games:

4. INTEGERS

This game is similar to poker, having a hierarchy of hands that correspond to poker hands. For example, **four of the same integer (four of a kind)** would win over five consecutive integers (a straight). ... (Morales, column 3, lines 12-18; emphasis added.)

Accordingly, since his Integers card game must be played with a deck containing four suits, deleting two suits from Morales' deck would render the modified deck inoperative for its intended use in the Integers card game. As noted above, one skilled in the art would not modify the playing cards of Morales to make them unsuitable for their intended purpose. *Ex parte Rosenfeld*, supra. Hence, Morales, in effect, also teaches away from reducing the number of suits in his deck from four to two. *In re Gordon*, supra.

In addition, nothing in Heckman counteracts the fact that Morales teaches away from reducing the number of suits in his deck from four to two. Furthermore, as noted in above section V(C), Heckman fails to provide any suggest or motivation for including higher integers on Morales' playing cards.

In addition, amended claim 1 also requires, inter alia, the following claim limitations or elements:

| <u>Claim Element</u> | <u>Description of Claim Element</u> |
|----------------------|---|
| 1a | "each set comprises $2M + 1$ playing cards" |
| 2a | "each playing face of each playing card of the first set displays an integer within the range of $-M$ to M which is different from all the other integers displayed on all the other playing faces of the playing cards of the first set" |
| 3a | "each playing face of each playing card of the second set displays an integer within the range of $-M$ to M which is different from all the other integers displayed on all the other playing faces of the playing cards of the second set" |

Accordingly, when M equals 10, elements 1a-3a of amended claim 1 respectively require (1) that each of the two sets comprise 21 playing cards (i.e., when $M = 10$, $2M + 1 = 21$) and, as shown in the following Table B, (2) that each of the 21 playing faces of the 21 playing cards of the first set display a different integer within the range of -10 to $+10$ and (3) that each of the 21 playing faces of the 21 playing cards of the second set display a different integer within the range of -10 to $+10$.

Table B

Claim 1 – Integers Required to be Displayed and Number of Playing Cards
Required Per Set When M Equals 10

| <u>Required Playing Cards</u> | <u>Required Displayed Integers</u> | |
|-------------------------------|------------------------------------|---------------------------|
| | <u>1st Set</u> | <u>2nd Set</u> |
| 1 | 10 | 10 |
| 2 | 9 | 9 |
| 3 | 8 | 8 |
| 4 | 7 | 7 |
| 5 | 6 | 6 |
| 6 | 5 | 5 |
| 7 | 4 | 4 |
| 8 | 3 | 3 |
| 9 | 2 | 2 |
| 10 | 1 | 1 |
| 11 | 0 | 0 |
| 12 | -1 | -1 |
| 13 | -2 | -2 |
| 14 | -3 | -3 |
| 15 | -4 | -4 |
| 16 | -5 | -5 |
| 17 | -6 | -6 |
| 18 | -7 | -7 |
| 19 | -8 | -8 |
| 20 | -9 | -9 |
| 21 | -10 | -10 |

In contrast, as can be seen from Morales' FIG. 1 and the excerpts from his specification quoted above in section V(C), Morales only teaches decks (1) whose sets comprise only 13 playing cards per set and (2) whose playing faces only display integers within the range of -6 to +6. Furthermore, nothing in Morales teaches or suggests either increasing the number of playing cards per set or increasing the range of integers displayed on the playing faces of playing cards.

While the Office Action relies on Heckman to support its rejection of claims 1-3, for the reasons mention in above section V(C), Heckman fails to provide any suggestion or motivation for including higher positive integers on Morales' playing cards. Furthermore, Heckman also fails to provide any suggestion or motivation for including lower negative integers (e.g., -7, -8, -9, -10, etc) on Morales' playing cards. In addition, Heckman fails to provide any suggestion or motivation for expanding the number of playing cards in Morales' sets from 13 playing cards per set to a minimum of 21 playing cards per set.

Since claims 2-3 depend from amended claim 1, all of claim 1's foregoing claim limitations are also required by claims 2-3. In addition, claims 2-3 are further distinguishable from the references because these claims require even more playing cards per set and an even wider range of integers than mandated by amended claim 1. In particular, claim 2's requirement that M equal 12 mandates (a) that each set comprise 25 playing cards (i.e., when $M = 12$, $2M + 1 = 25$) and (b) that each of the 25 playing faces of the 25 playing cards display a different integer within the range of -12 to +12. Similarly, claim 3's requirement that M equal 13 mandates (a) that each set comprise 27 playing cards (i.e., when $M = 13$, $2M + 1 = 27$) and (b) that each of the 27 playing faces of the 27 playing cards display a different integer within the range of -13 to +13.

Therefore, for the reasons discussed in this section VI, withdrawal of the 103(a) rejection of claims 1-3 over Morales in view of Heckman is respectfully requested.

VII. New Claims 21-32

For the following reasons new claims 21-32 also patentable over the references.

A. New Claims 21-24

New claims 21-24 depend, directly or indirectly, from amended claim 1 and, therefore, all the claim limitations discussed above in section VI are also required by claims 21-24. Accordingly, new claims 21-24 are patentable over Morales and Heckman for the reasons discussed in preceding section VI with respect to amended claim 1.

In addition, new claim 21 further restricts the claimed deck by requiring that "the graphics for the integer displayed on each playing face of each playing card of the first set **consist of** at least one representation of the Arabic numeral for the displayed integer and the graphics for the integer displayed on each playing face of each playing card of the second set **consist of** at least one representation of the Arabic numeral for the displayed integer." (Emphasis added.) The "consist of" claim limitation of new claim 21 mandates that only Arabic numerals be used for the integers displayed on the playing faces of the playing cards.

In contrast, as can be seen from Morales' FIG. 1 and the following excerpts from his specification, Morales teaches that each integer displayed on

each playing face of each playing card of each of his four sets or suits be graphically illustrated using both (1) the Arabic numeral for that integer and (2) a number of symbols for a single arithmetic operation equal to the absolute value of the displayed Arabic integer:

The deck consists of 52 cards, each containing integers between -6 and +6. **There are four "suits," each being a different arithmetic operation symbol (e.g., addition, multiplication, etc.).** (Morales, Abstract, lines 2-5; emphasis added.)

• • •

The game apparatus of the present invention is a deck of 52 cards, consisting of four sets of cards, each marked with the integers -6 through +6, inclusive. **Each set contains a notation indicating a different arithmetic operation; thus, one set indicates addition, another subtraction, still another multiplication, and finally, division.** (Morales, column 1, lines 38-45; emphasis added.)

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FIG. 1 shows the front faces of the game cards, the deck being divided into four columns **to display equal apportionment of integers, arithmetic operations, and colors with the deck.** (Morales, column 2, lines 11-14; emphasis added.)

• • •

Referring now to the drawings in greater detail, the invention 1 shown in FIG. 1 consists of a plurality of playing cards ... **It can be further seen that the four basic mathematical operations are indicated on the cards (+, -, x, and ÷), also equally apportioned so that each card contains a different combination of arithmetic operation and integer notations.** ... Thus, the deck is similar in configuration to a conventional deck having ... **four suits (+, -, x, and ÷) ...** (Morales, column 2, lines 22-36; emphasis added.)

In view of the above excerpts, Morales teaches that the graphics for each integer displayed on each playing face of each playing card of each of his four sets or suits comprise both (1) the Arabic numeral for that integer and (2) a number of symbols for a single arithmetic operation equal to the absolute value of the displayed Arabic number.

Furthermore, as can be seen from the following excerpt, a deck composed of playing cards whose playing faces display both an arithmetic operation and an integer is required in order to play at least one of Morales' card games:

3. ADDING; SUBTRACTING; MULTIPLYING; DIVIDING

The players each draw two cards on a given play. **The child must perform the operation indicated on the first card with the two integers. ... For example, if a player draws a pair denoting (6+,4x), his value for the draw is 10 (adding six and four), but if he draws (4x,6+), his value would be 24 (multiplying four and 6).** (Morales, column 2, line 62 through column 3, line 6; emphasis added.)

Accordingly, since Morales' above quoted card game must be played with a deck whose playing faces display both arithmetic operations and integers, deleting the arithmetic operations from the playing faces of Morales' playing cards would render the modified deck inoperative for its intended use in this card game. As previously mentioned, one skilled in the art would not modify the playing cards of Morales to make them unsuitable for their intended purpose. *Ex parte Rosenfeld*, supra. Therefore, Morales, in effect, also teaches away from eliminating the arithmetic operations from the face of his playing cards. *In re Gordon*, supra.

Furthermore, nothing in Heckman counteracts the fact that Morales teaches away from eliminating the arithmetic operations from the face of his playing cards.

Since new claims 23-24 depend from new 21, claims 23-24 also contain all the above-discussed limitations of new claim 21 and, hence, are also patentable over Morales and Heckman for the reasons discussed above with respect to new claim 21.

In addition, new claim 22-24 are even further patentably distinguishable from the references because of the additional claim limitations required by these claims. In particular, new claim 22 states "the graphics displayed on each playing face of each playing card of the first set **consist of at least one** representation of the Arabic numeral for the displayed integer and the graphics displayed on each playing face of each playing card of the second set **consist of at least one** representation of the Arabic numeral for the displayed integer". (Emphasis added.) The "consisting of" claim limitation of new claim 22 excludes all graphics from the playing faces of the playing cards of the first and second sets except for one or more representations of the Arabic numeral for the respective displayed integers.

With respect to new claims 23-24, these claims, like claims 2-3 discussed above in section VI, require M to equal 12 or 13, respectively. Accordingly new claims 23-24 are further patentable over the references for the reasons previously mentioned in section VI in reference to claims 2-3, respectively.

B. New Claims 25-26

Since new claims 25-26 depend, directly or indirectly from claim 17, claims 25-26 contain all the claim limitations or elements of claim 17 and, therefore, are patentable over the references for the reasons discussed in above section V(C) with respect to claim 17.

In addition, new claims 25-26 are further patentable over the references because each of these claims mandate that the playing faces of the playing cards of each of the required sets only display 0 or positive integers. In particular (and keeping in mind that M is required to be an integer at least equal to 10), claim 25 requires that "the integers displayed on the playing faces of the playing cards of the first set **consist of** integers within the range of 0 to M and the integers displayed on the playing faces of the playing cards of the second set **consist of** integers within the range of 0 to M" and claim 26 requires that "the integers displayed on the playing faces of the playing cards of the first set **consist of** integers within the range of 0 to M; the integers displayed on the playing faces of the playing cards of the second set **consist of** integers within the range of 0 to M; the integers displayed on the playing faces of the playing cards of the third set **consist of** integers within the range of 0 to M; and the integers displayed on the playing faces of the playing cards of the fourth set **consist of** integers within the range of 0 to M". (Emphasis added.) The "consisting of" claim limitation of new claims 25-26 require that the integers displayed on the playing faces of the playing cards be either 0 or a positive integer.

In contrast, as previously mentioned in above section V(C), (1) Morales teaches the presence of negative integers on approximately half of the playing faces of the playing cards of each of his 4 sets and (2) the removal of negative

integers from those playing faces of Morales' playing cards would render the modified deck inoperative for Morales' intended purpose.

C. New Claims 27-30

Like new claim 21 discussed in above section VII(A), new claims 27 and 29-30 also require that "the graphics for the integer displayed on each playing face of each playing card of [each of its sets] consist of at least one representation of the Arabic numeral for the displayed integer." (Emphasis added.) Accordingly, new claims 27 and 29-30 are patentable over the references for the reasons previously discuss in section VII(A) with respect to the presence of this claim limitation in claim 21.

In addition, new claim 28, like new claim 22 discussed in above section VII(A), also requires that "the graphics displayed on each playing face of each playing card of [each of its sets consist of at least one representation of the Arabic numeral for the displayed integer". (Emphasis added.) Hence, new claim 28 is also patentable over the references for the reasons mentioned above in section VII(A) with respect to the presence of this claim limitation in claim 22.

Moreover, the decks of new claims 27-30 are required to comprise a minimum of four sets of playing cards. In addition, each of new claims 27-30 further require that "each set [comprise] $2M + 1$ playing cards", with new claims 27-28 requiring that " M [be] an integer at least equal to 10", new claim 29 requiring that " M [equal] 12, and new claim 30 requiring that " M [equal] 13". Since each of the decks of claims 27-30 comprises a minimum of four sets and since there are $2M + 1$ playing cards per set, the minimum number of playing cards required to be present in the decks of new claims 27-30 can be calculated using the formula $4(2M + 1)$ by substituting for M the minimum value for M

specified in new claims 27-30. The results of these calculations are shown in the following Table C:

Table C

| <u>Claim</u> | <u>Minimum M Value</u> | <u>Minimum Number of Playing Cards Per Deck</u> |
|--------------|------------------------|---|
| 27-28 | 10 | 84 |
| 29 | 12 | 100 |
| 30 | 13 | 104 |

In contrast to the above minimum playing card requirements of claims 27-30, as the following excerpts show, Morales teaches a deck that contains only 52 playing cards:

The deck consists of **52 cards** ... (Morales, Abstract, line 2; emphasis added.)

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The game apparatus of the present invention is a deck of **52 cards** ... (Morales, column 1, lines 38-39; emphasis added.)

Accordingly, since the minimum number of playing cards required by the decks of new claims 27-30 is substantially greater than the number of playing cards per deck taught by Morales and since none of the references either suggests or provides a motivation for substantially increasing the number of playing cards in Morales' deck, the substantially increased number of playing cards per deck required by new claims 27-30 provides an additional basis for patentably distinguishing these claims over the prior art.

D. New Claims 31-32

Since new claims 31-32 contain virtually all the limitations present in claim 17, these claims are also patentable over the references for the reasons discussed in above section V(C) with respect to claim 17.

Furthermore, new claims 31-32 are even more restrictive than claim 17, because new claims 31-32 further require that "each playing face of each playing card within any particular set displays an integer within the range of 0 to M which is different from all the other integers displayed on all the other playing faces of all the other playing cards within its particular set", whereas claim 17 only subjects a first and a second set of playing cards of a deck (that may contain additional sets of playing cards) to a similar claim limitation.

Furthermore, new claim 32 is even further patentably distinguishable over the references for the reasons discussed in preceding section VII(C) with respect to new claim 26 because claim 32, like claim 26, similarly requires "the integers displayed on the playing faces of the playing cards within any particular set **consist of** integers within the range of 0 to M". (Emphasis added.)